UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/806,511	04/16/2001	Bernard Aspar	204403USOPCT	9345

22850 7590 01/15/2004

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
LATTIN, CHRISTOPHER W	
ART UNIT	PAPER NUMBER
2812	

DATE MAILED: 01/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/806,511	ASPAR ET AL.	
	Examiner	Art Unit	
	Christopher W Lattin	2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 11/07/2003.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 22-42 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 22-42 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 22-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (U.S. Patent 5,633,174) in view of Hara et al. (Precipitation Control by Hydrogen and Preannealing at 425 °C in Czochrolalski silicon Crystals; Int. Confer. Of Solid State Devices and Materials, p. 35-37; cited by applicant).

Li teaches a method of forming a layer of microcavities by introducing a gaseous species into the substrate of the second material such as hydrogen, forming precipitate embryos from the nucleation centers, and growth of the precipitates, wherein the precipitates are formed from species in the second material, and wherein growth is carried out by thermal diffusion, the substrate is silicon, but fail to teach that precipitate embryos are grown through species concentration of, for instance, oxygen, thus producing an embedded layer of silicon dioxide. Hara et al. teach a method of using hydrogen to increase the diffusion coefficient of oxygen to cause embryo formation and precipitation. One skilled in the art at the time of the invention would have been motivated to concentrate oxygen as taught by Hara et al. as part of the method of Li in order to form an oxide layer and thus obtain a thin surface layer with an embedded layer with good insulating properties, for example, oxygen.

Response to Arguments

Applicant's arguments initially filed 12/11/02, repeated in the paper filed 8/21/2003 and yet again repeated in the paper filed 11/07/2003 have been fully and exhaustively considered but they are not persuasive.

Applicant again argues that Li fails to teach implantation of a first material into a substrate of a second material. Li does teach implantation first material of hydrogen into a second material of silicon. Applicant repeats the submission that the incorporation of hydrogen by Li is not a second material. See applicants remarks page 8. Applicant then, repeats the seeming contradiction that the claimed method is drawn to forming a "layer of microcavities can be ... by implantation of hydrogen..." Id. at 9. Therefore, applicant argues that the presently claimed method of incorporating a second material, hydrogen, is different than the prior art, which teaches incorporating hydrogen, which applicant submits is not a second material. This is rationale, which flies in the face of reason is not found to be persuasive.

Applicant further repeats the argument that Li teaches away from the present invention and that Hara et al. fail to remedy the deficiencies of Li with respect to the present claims. Li teaches that hydrogen annealing is superior to traditional isolation techniques including forming silicon on an insulating substrate. Hara et al. teach utilizing hydrogen to precipitate oxygen to enhance the performance properties of the substrate. One skilled in the art at the time of the invention would have found these methods complimentary and would have been motivated to further enhance the properties gained by the Li method through incorporation of the method taught by Hara

et al. Therefore, in view of these disclosures, one would be motivated to form oxygen precipitates to enhance the properties of later formed semiconductor devices, not to form an SOI structure *per se*, thus in keeping with the disclosure of Li.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Lattin whose telephone number is (703) 305-3017. The examiner can normally be reached Monday through Friday from 8:00 A.M. to 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling, can be reached at (703) 308-3325. The fax number for this Group is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

CWL
January 12, 2004

John F. Niebling
Supervisory Patent Examiner
Technology Center 2800